1. (currently amended) An ultrasonic diagnostic imaging system which acquires three dimensional image data sets by the scanning of a one-dimensional array transducer comprising:

an array transducer including an array of transducer elements extending in an azimuth direction and an elevation dimension normal to the azimuth direction;

a position actuator, coupled to the array transducer, which acts to sweep the array transducer in reciprocating directions substantially in the elevation dimension; and

a transmitter, coupled to the array transducer, which acts to cause the array transducer to transmit a sequence of beams in the azimuth direction, wherein a first sequence of beams is transmitted when the transducer is swept in one reciprocating direction, and a second sequence of beams is transmitted in a second sequence of beams which is the reverse of the first sequence when the transducer is swept in another reciprocating direction.

2. (previously presented) The ultrasonic diagnostic imaging system of Claim 1, wherein the array transducer comprises a one-dimensional array transducer; and

wherein the position actuator comprises an oscillating mechanism which acts to sweep the array transducer in a forward direction from a first turn-around position to a second turn-around position, and in a reverse direction from the second turn-around position to the first turn-around position.

3. (previously presented) The ultrasonic diagnostic imaging system of Claim 2, wherein the transmitter further acts to cause the array transducer to transmit a sequence of beams from the left side of the array transducer to the right side of the array transducer when the position actuator is sweeping the array transducer in the forward direction, and acts to cause the array transducer to transmit a sequence of beams from the right side of the array transducer to the left side of the array transducer when the position actuator is sweeping the array transducer in the reverse direction.

4. (previously presented) The ultrasonic diagnostic imaging system of Claim 3, wherein the transmitter further acts to cause the array transducer to scan a series of scan planes as the array transducer is swept in the forward direction, and acts to cause the array transducer to scan the same series of scan planes as the array transducer is swept in the reverse direction.

5. (previously presented) The ultrasonic diagnostic imaging system of Claim 3, wherein the transmitter further acts to cause the array transducer to scan a series of scan planes as the array transducer is swept in the forward direction, and acts to cause the array transducer to scan a parallel series of scan planes as the array transducer is swept in the reverse direction.

6. (previously presented) The ultrasonic diagnostic imaging system of Claim 2, wherein the transmitter further acts to cause the array transducer to repetitively transmit a sequence of beams from the left side of the array transducer to the right side of the array transducer when the motive device is sweeping the array transducer in the forward direction, and acts to cause the array transducer to repetitively transmit a sequence of beams from the right side of the array transducer to the left side of the array transducer when the motive device is sweeping the array transducer in the reverse direction.

7. (previously presented) The ultrasonic diagnostic imaging system of Claim 6, wherein the transmitter further acts to cause the array transducer to scan a series of scan planes as the array transducer is swept in the forward direction, and acts to cause the array transducer to scan the same series of scan planes as the array transducer is swept in the reverse direction.

8. (currently amended) A method for scanning a volumetric object with a moving array transducer having a plurality of elements extending in an azimuth dimension and exhibiting an elevation dimension normal to the azimuth dimension comprising:

sweeping the array transducer in a forward direction which is substantially ~~normal to~~ in the elevation dimension of the array transducer;

actuating the elements of the array transducer to transmit a first sequence of beams as the array transducer is swept in the forward direction;

sweeping the array transducer in a reverse direction which is substantially ~~normal to~~ inthe elevation dimension of the array transducer; and

actuating the elements of the array transducer to transmit a second sequence of beams in the opposite direction as the first sequence as the array transducer is swept in the reverse direction.

9. (original) The method of Claim 8, wherein sweeping the array transducer in the forward direction comprises sweeping the array transducer from a first turn-around position to a second turn-around position; and

wherein sweeping the array transducer in the reverse direction comprises sweeping the array transducer from the second turn-around position to the first turn-around position.

10. (original) The method of Claim 9, wherein actuating the elements of the array transducer to transmit a first sequence of beams further comprises transmitting a sequence of beams from left to right in the azimuth direction; and

wherein actuating the elements of the array transducer to transmit a second sequence of beams further comprises transmitting a sequence of beams from right to left in the azimuth direction.

11. (original) The method of Claim 9, wherein actuating the elements of the array transducer to transmit a first sequence of beams further comprises repetitively transmitting a sequence of beams from left to right in the azimuth direction; and

wherein actuating the elements of the array transducer to transmit a second sequence of beams further comprises repetitively transmitting a sequence of beams from right to left in the azimuth direction.

12. (original) The method of Claim 9, wherein actuating the elements of the array transducer to transmit a first sequence of beams further comprises transmitting a sequence of beams of a scan plane from left to right in the azimuth direction; and

wherein actuating the elements of the array transducer to transmit a second sequence of beams further comprises transmitting a sequence of beams in the same scan plane from right to left in the azimuth direction.

13. (currently amended) A method for scanning a volumetric object with a moving array transducer having a plurality of elements extending in an azimuth dimension and exhibiting an elevation dimension normal to the azimuth dimension comprising:

sweeping the array transducer in a forward direction which is substantially ~~normal to~~in the elevation dimension of the array transducer;

scanning a sequence of ~~scan planes~~beams from a first side of each scan plane to a second side of each scan plane as the array transducer is swept in the forward direction;

sweeping the array transducer in a reverse direction which is substantially ~~normal to~~in the elevation dimension of the array transducer; and

scanning a sequence of ~~scan planes~~beams from the second side of each scan plane to the first side of each scan plane as the array transducer is swept in the reverse direction.

14. (original) The method of Claim 13, wherein scanning a sequence of scan planes comprises scanning a sequence of substantially parallel scan planes which extend into the volumetric object.

15. (original) The method of Claim 13, wherein the sequence of scan planes which is scanned as the array transducer is swept in the forward direction is substantially aligned with the sequence of scan planes which is scanned as the array transducer is swept in the reverse direction.